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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,630	10/03/2000	Leon Forman	320-4(a)	5469

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EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 09/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/677,630

Applicant(s)

FORMAN, LEON

Examiner

Rick Palabrica

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 11-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election without traverse of Group 1 (claims 1-10) in Paper No. 3, dated 8/15/02, is acknowledged.

Specification

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e., failing to provide an enabling disclosure.

On page 14, lines 15+, the applicant refers to Fig. 4 and discloses target yield as a function of acceleration voltage. The disclosure is insufficient as to: a) why exactly does the figure refer to acceleration voltage in volts or kv, whereas the text and claim 4 refer to the same quantity in keV; b) how exactly can the ordinate of said figure, which shows the unit of yield/microcoulomb, be equivalent to the yield/microampere given in

the text and in claim 4. The same objection applies to page 15, 1st paragraph of the specification.

On page 12, last two sentences, the applicant discloses that the beam is steered by "rasterizing." The disclosure is insufficient as to: a) what exactly are the components of this steering means and what exactly are its attributes (e.g., voltage and power ratings); and b) how exactly is this steering means deployed with respect to the neutron generator to so achieve its function.

Claim 3 recites that the neutron generator is capable of operating at 25 watts. There is neither an adequate description nor enabling disclosure as to how and in what manner said generator so operates at 25 watts.

Claims 5, 6 and 8 recite means for steering the ion beams. There is neither an adequate description nor enabling disclosure as to how and in what manner said means is so achieved in the claimed invention.

Claim Rejections - 35 USC § 112

3. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification in section 2 above.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "exit slit" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Reifenschweiler ("Neutrons from Small Tubes – Philipps Tube: Continuous or Pulsed Operation," Nucleonics, Vol. 18, No. 12, December 1960) or Chen et al. (U.S. 5,293,410).

Reifenschweiler discloses in Fig. 2 a sealed neutron generator tube comprising an electron bombardment source (replenisher of zirconium filament wire heated by a 0-4 volt power source), a high voltage acceleration stage (i.e., accelerating space), and a self-loading target, said target being mounted in a hollow needle. Note that based on the scale provided in Fig. 2, the ion extraction slit at the exit of the ion source, and the focusing aperture at the entrance to the needle each have a size of at least 3mm.

As to "wherein" clauses in claims 3, 4 and 10, and the clause after "filament" in claim 7, these clauses are essentially method limitations or statement of intended or desired use. These clauses do not serve to patentably distinguish the claimed structure

over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does."
Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

Notwithstanding the above inapplicability of the cited limitations, Reifenschweiler's neutron generator produces $2.4\text{-}3 \times 10^8$ n/sec of 4.3 MeV energy, for an accelerating voltage of 125 kv and an ion beam current of 100 μa (see page 71, 1st column).

Chen et al. disclose in Fig. 1 a neutron generator comprising an electron emitter (81), a high voltage acceleration stage that is established between the extracting electrode (50) and suppressor electrode (75) and a deuterium-and tritium-filled target (73). There is an extraction aperture (47) of an extraction electrode (50), as well as a focusing aperture (78) that leads the ions to the target (73).

As to the ion extraction slit and focusing aperture being equal to or greater than 3 mm (see claim 1), Chen et al. disclose that the anode (57) has a diameter of approximately 11.4 mm (see column 6, lines 63+). Fig. 1 shows that this anode

diameter has approximately the same dimension as the extraction aperture (47), and the focusing aperture (78) is only slightly smaller than the extraction aperture.

Therefore, both apertures 47 and 78 have dimensions that meet the limitation in claim 1.

Note that while patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of the claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

As to claim 2, applicant's claim language, "hollow needle" reads on Chen et al.'s structure 75 that encloses target 73. They also disclose that the apparatus has an pulse or continuous output ranging from 10^7 to 10^9 n/sec.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reifenschweiler, as applied to claims 1-4, 7 and 10 above, and further in view of Chen et al. (U.S. 6,297,507 B1), hereinafter referred to as Chen-2. Reifenschweiler

discloses the applicant's claims except the means of steering the ion beam and the 5 cm gap between the extraction slit and the needle.

Chen-2 discloses in Fig. 4A a sealed neutron generator that has a focusing assembly (4) disposed between the ion source (3) and accelerating electrode (5) (see column 5, lines 20+). This focusing assembly comprises plane lens (4A, 4B and 4C) that are powered by direct current (see column 7, lines 35+). Chen-2 also teaches that an ion optics program is used to adjust the apertures of the plane lens 4A, 4B and 4C and accelerating electrode 5, and the gaps between each other so as a satisfactory ion beam intensity and hitting accuracy of the beam can be obtained. One having ordinary skill in the art would have recognized that these teachings in Chen-2 would apply and be advantageous to a neutron generator such as Reifenschweiler's apparatus.

As to the wherein clause in claim 8, this is essentially a method that does not serve to patently distinguish the claimed structure over that of the reference. See section 5 above.

As to the limitation in claim 9, note that the needle in the Reifenschweiler neutron generator is approximately 10 cm long (see Fig. 2). Also, the specific distance between the extraction slit and the needle (i.e., 5 cm) would be obvious as being part of optimization under the above teaching of Chen-2 regarding an ion optics program. See MPEP 2144.05 Part II.A.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Reifenschweiler, by the teachings in Chen-2 to include a means for focusing or steering

the ion beam and to apply an ion optics program to adjust the distance the extraction slit and the needle to 5 cm, to gain the advantages thereof (e.g., accuracy), because such modification is no more than the use of conventional designs/techniques in nuclear instrumentation within the nuclear art.


Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C-E further illustrate prior art.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.


MICHAEL J. CARONE
SUPERVISORY PENDING EXAMINER